1.0 INTRODUCTION

PURPOSE OF THIS SECTION

The purpose of this section is to provide introductory information to help readers understand this plan, which is particularly complex for several reasons.

INFORMATION IN THIS SECTION

This section explains the purpose of this plan and describes its scope. It briefly summarizes the background related to the decommissioning.

It then discusses the two environmental impact statements that pertain to the decommissioning, along with the decommissioning criteria. It briefly describes four programs pertaining to the decommissioning that would be carried out in accordance with Department of Energy directives and technical standards: (1) project management and organization, (2) the health and safety program, (3) the environmental monitoring and control program, and (4) the radioactive waste management program.

It describes the interim end state for the site that would be reached at the conclusion of deactivation work scheduled to end in 2011, which would form the starting conditions for the Phase 1 decommissioning work. It then briefly summarizes the Phase 1 decommissioning work.

Finally, this introduction briefly describes the responsibilities of the organizations involved, explains how the plan is organized, and describes the process to be used to control changes to the plan after initial approval by the Nuclear Regulatory Commission.

RELATIONSHIP TO OTHER PLAN SECTIONS

The information in this section establishes the context for the other parts of this plan.

1.1 Purpose

This plan is being issued by the U.S. Department of Energy (DOE) to fulfill part of its statutory obligations under Public Law 96-368, the West Valley Demonstration Project (WVDP) Act of 1980, which holds DOE responsible for decontamination and decommissioning of facilities used in solidification of high-level radioactive waste (HLW) and material and hardware used in connection with this project.[1]

[1] The WVDP Act states that "The Secretary [of Energy] shall decontaminate and decommission (A) the tanks and other facilities of the Center in which the high level waste solidified under the project was stored, (B) the facilities used in the solidification of the waste, and (C) any material and hardware used in connection with the project, in accordance with such requirements that the [Nuclear Regulatory] Commission may prescribe."

The proposed decommissioning is being accomplished in two phases following a "phased decision-making" approach. This plan addresses proposed Phase 1, describing:

(1) The activities that would take place during this phase of the decommissioning;

(2) The site conditions that would exist at the conclusion of Phase 1; and

(3) The methods that would be used to organize and manage the project, to protect the health and safety of workers and the public, to protect the environment, and to ensure quality in the decommissioning work.

Phase 2 of the proposed decommissioning would be accomplished using an approach determined after completion of additional studies and evaluations to be the most appropriate.

This plan also provides information to the U.S. Nuclear Regulatory Commission (NRC) on the first of the two proposed phases of the WVDP decommissioning, consistent with the related 1981 Memorandum of Understanding between DOE and NRC (DOE and NRC 1981), which calls for DOE to submit a decommissioning plan to NRC for review. On February 3, 2003, NRC specifically requested that DOE submit a decommissioning plan for the WVDP portion of the site (NRC 2003a). DOE agreed to do so in its response of February 28, 2003 (DOE 2003a).

1.2 Scope

Under the provisions of the WVDP Act, DOE exercises control over a portion of the Western New York Nuclear Service Center (the Center) for the purpose of carrying out the WVDP. The Center is owned by the New York State Energy Research and Development Authority (NYSERDA), who is the NRC licensee.

The area controlled by DOE comprises approximately 168 acres, lies in the approximate middle of the Center, and contains the facilities used by Nuclear Fuel Services, Inc. (NFS) from 1966 through 1972 to reprocess spent nuclear fuel. This area is known as the project premises.

A small stream divides the project premises into two regions known as the north plateau and the south plateau. The facilities used by NFS are located on the north plateau, with the exception of two shallow land radioactive waste disposal facilities known as the NRC-Licensed Disposal Area (NDA) and the State-Licensed Disposal Area (SDA)[2], which are located on the south plateau.

The facilities of interest in Phase 1 of the proposed decommissioning are located on the north plateau, with one exception: the WVDP Radwaste Treatment System Drum Cell on the south plateau, which was used for radioactive waste storage. Phase 1 of the proposed WVDP decommissioning would entail removal of the Radwaste Treatment System Drum Cell and all of the north plateau facilities with the exceptions of the Waste Tank Farm with its four

[2] The SDA, which is not part of the project premises, is managed by NYSERDA, licensed by the New York State Department of Health, and permitted by the New York State Department of Environmental Conservation (NYSDEC).

underground waste storage tanks, the waste tank farm supporting facilities, and the Construction and Demolition Debris Landfill.

Phase 1 activities include remediation of the "source area" portion of the impacted area known as the north plateau groundwater plume, where groundwater and subsurface soil is contaminated with radioactivity from spent fuel reprocessing. The source area lies underneath the Main Plant Process Building. The non-source area of the plume, which is downgradient of the building, would be considered during Phase 2 of the proposed decommissioning.

Phase 1 includes removal of impacted soil in excavations dug to remove the facilities in the Process Building and Vitrification area and in a portion of the Low-Level Waste Treatment Facility area. Phase 1 also includes characterization of soil and stream sediment within the project premises, especially in the Phase 1 areas.[3]

Phase 2, which this plan does not address, would complete the proposed decommissioning for the Waste Tank Farm, the Construction and Demolition Debris Landfill area, the NDA, and the non-source area of the north plateau groundwater plume, following an approach determined later through additional studies and evaluations to be the most appropriate, as noted previously. These studies and evaluations are beyond the scope of this plan, except for the soil and sediment characterization within the project premises to be accomplished early in Phase 1, which is discussed in Section 1.10.2.

The Phase 1 activities are designed to be conservative with respect to the extent of remediation in the areas of interest to avoid prejudicing the decision on the Phase 2 approach. More information on the facilities within the scope of this Phase 1 plan appears in Section 1.10.2.

While this plan provides for removal of certain radioactive facilities and remediation of surface and subsurface soil on portions of the project premises, it does not address license termination of any portion of the site. Licensing matters are not within DOE's purview since DOE is neither the licensee nor the property owner. However, the work accomplished under this plan would result in data that can potentially be used by NYSERDA in support of license termination for portions of the Center.

This plan focuses primarily on radioactivity. Hazardous and toxic materials are addressed in some instances and activities specified in this plan would be in compliance with the Resource Conservation and Recovery Act. However, closure of facilities under the provisions of the Resource Conservation and Recovery Act is being addressed separately in coordination with appropriate state and federal agencies and is not within the scope of this plan.

[3] The project premises is the portion of the site controlled by DOE as shown in Figure 1-1. The Phase 1 areas are those within the scope of this plan. The Phase 2 areas are the Waste Tank Farm area, the Construction and Demolition Debris Landfill, the non-source area of the north plateau groundwater plume, and the NDA. Although the Waste Tank Farm area is considered to be a Phase 2 area, limited work would be performed in this area during Phase 1, as discussed below. Characterization of soil and sediment in the Phase 2 source areas would be limited and would not include the NDA.

The approach described in this plan represents DOE's preferred alternative among those alternatives evaluated in the *Environmental Impact Statement on Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center*, hereafter referred to as the Decommissioning EIS.[4] Under this alternative, the decommissioning would be performed in two phases, as indicated above.

The organization and content of this plan are based on NRC guidance in Volume 1 of NUREG-1757, *Consolidated Decommissioning Guidance, Decommissioning Process for Materials Licensees* (NRC 2006) and agreements made between NRC and DOE on the applicability of this guidance to the Phase 1 plan (NRC 2008). This plan would be supplemented by more detailed plans for demolition of major facilities that would be completed prior to the start of the decommissioning.

The Unique Nature of the Phase 1 Decommissioning

Among the atypical elements of this decommissioning are (1) the radiological complexity of the site; (2) the project being carried out under the WVDP Act; (3) the project being carried out by a department of the federal government when the property is owned by a New York State Agency that is the NRC licensee; and (4) the purpose of the Phase 1 decommissioning work being limited to removing certain facilities and remediating impacted soil in certain areas, rather than terminating the NRC license.

1.3 Background

Situated approximately 30 miles south of Buffalo on 3,345 acres of property owned by the State of New York, the Center is the location of the only NRC-licensed commercial spent nuclear fuel reprocessing facility to operate in the United States. NFS reprocessed irradiated nuclear fuel to recover uranium and plutonium until 1972. Figure 1-1 shows a portion of the Center and the WVDP as they appeared in 2006.

The reprocessing operations produced approximately 600,000 gallons of HLW, which were stored in two underground waste tanks. These operations were conducted under License CSF-1, which was issued by the U.S. Atomic Energy Commission in 1966. After NFS withdrew from the reprocessing business in 1976, NYSERDA became the sole licensee.

Reprocessing work resulted in extensive radioactive contamination of site facilities, especially the Main Plant Process Building where the chemical processes that separated uranium and plutonium from fission products in the spent fuel were carried out. The Low-

[4] When this plan was completed, the Decommissioning EIS existed in the form of the *Revised Draft Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center*. If changes are made to the Decommissioning EIS during the course of the National Environmental Policy Act process that affect this plan, such as changes to the preferred alternative, this plan would be revised as necessary to reflect those changes.

Level Waste Treatment Facility – which included five lagoons – also became contaminated with licensed radioactivity.

Environmental contamination also resulted from site operations. The contaminated areas of most significance are known today as the north plateau groundwater plume and the cesium prong. The approximate lateral extent of both impacted areas is shown in Figure 1-1.[5]

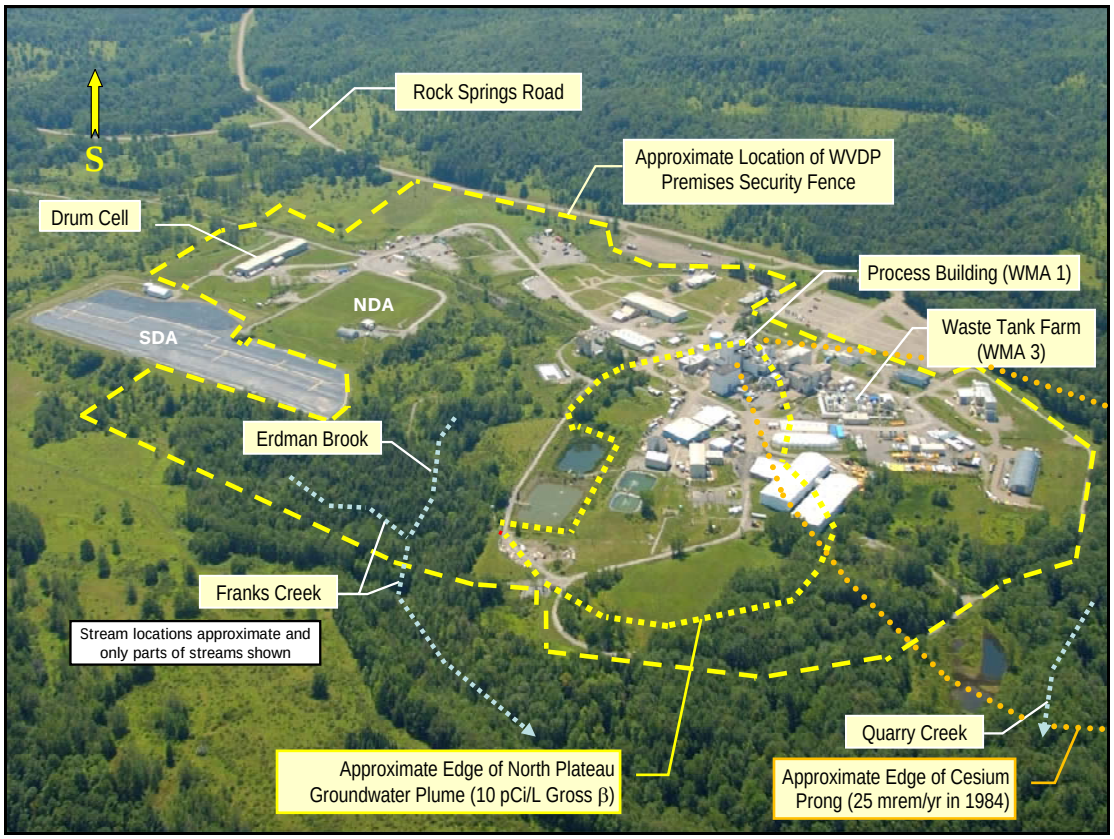

Figure 1-1. The Former Nuclear Fuel Reprocessing Plant and the WVDP in 2006

The north plateau groundwater plume impacts a subsurface area of more than 15 acres under and northeast of the Process Building. This contamination resulted from a leak of nitric acid solution containing licensed radioactive material that occurred during fuel reprocessing. Groundwater movement has carried mobile radionuclides such as strontium 90 approximately one-quarter mile northeast of the Process Building. Contamination beneath the Process Building is known to extend at least 40 feet below the ground.

[5] Note that the cesium prong area delineated on the figure provides only an approximation of the region of surface soil impacted by the ventilation system filter failure. Data to determine the extent of the resulting soil contamination on the project premises are not available. Such data would be collected early in Phase 1 of the decommissioning to establish the extent of residual surface and near surface soil contamination in the impacted area within the project premises.

The cesium prong, an impacted area that extends northwest of the Process Building, resulted from a 1968 ventilation system accident. A series of investigations that included aerial monitoring surveys has shown that cesium 137 released from the Process Building main stack contaminated surface soil in the northwest part of the Center and offsite.

Streams in the vicinity of the project premises were also impacted with radioactivity from regulated discharges of treated wastewater, surface water runoff, and contaminated groundwater that seeps to the surface at several points on the project premises.

There are also other places on the Center where environmental media have been impacted by unplanned releases of radioactivity. These include low levels of contamination in a drainage channel near a sewage outfall that resulted from a 1974 underground sewer line failure and low levels of contamination in drainage ditches resulting from a 1985 spill of radioactive condensate in the area of the underground waste tanks. Low levels of radioactive contamination have also been identified in surface and subsurface soil in other areas.

In 1980, Congress enacted the WVDP Act to establish the WVDP as a research and development project to demonstrate solidification techniques for HLW. The WVDP Act assigned the primary responsibility for the project to DOE, although it did not authorize the federal government to acquire title to the HLW.[6] Since 1981, portions of NYSERDA's NRC Part 50 license for the Center, including the technical specifications, have been effectively suspended by NRC to facilitate execution of the provisions of the WVDP Act.

In 2002, DOE completed solidification of the HLW using a vitrification process. The solidified HLW is contained within 275 stainless steel canisters that are presently stored in the Process Building. This material would have to remain on site until it can be transported to a federal geologic repository, which is one factor in DOE's decision to pursue a two-phase decommissioning approach.

DOE in recent years has been partially decontaminating portions of the Process Building and other facilities and removing unneeded ancillary facilities in preparation for the WVDP decommissioning. This effort is expected to culminate in 2011, achieving site conditions known as the interim end state, which are described in Section 1.10.1.

The amounts of residual radioactivity at the site are now substantially less than when the facility was shutdown in 1972 owing to radioactive decay and NFS and WVDP decontamination efforts. However, a significant amount of radioactivity will remain on site when the proposed Phase 1 decommissioning activities are scheduled to begin in 2011. The estimated amounts in key areas in 2011, exclusive of radioactivity in the HLW waste canisters, include:

- The Process Building, approximately 6200 curies;

[6] The WVDP Act states in pertinent part: "The Secretary [of DOE] shall carry out, in accordance with this Act, a high level radioactive waste demonstration project at the Western New York Service Center in West Valley, New York, for the purpose of demonstrating solidification techniques which can be used for preparing high level radioactive waste for disposal. . . . The State will make available to the Secretary the facilities of the Center and the high level radioactive waste at the Center which are necessary for completion of the project. The facilities and the waste shall be made available without transfer of title and for such period as may be required for completion of the project."

- The Vitrification Facility, approximately 1900 curies;
- Lagoon 1, approximately 750 curies;
- The four underground waste tanks, approximately 345,000 curies;
- The NDA, approximately, 180,000 curies; and
- The SDA, approximately, 83,000 curies.

The Process Building, the Vitrification Facility, and the Low-Level Waste Treatment Facility lagoons are addressed in Phase 1 of the proposed decommissioning, as explained below. The other facilities – commonly referred to, along with the radioactivity in the non-source area of the north plateau groundwater plume, as Phase 2 sources – would be addressed in Phase 2 of the proposed decommissioning.

1.4 Environmental Impact Statements

In 1996, DOE prepared a Draft EIS covering the remaining actions to be completed under the WVDP Act and evaluating different alternatives for closure and long-term stewardship of the facilities at the Center. Based upon comments received, ongoing discussions between DOE and NYSERDA, and various other factors, DOE decided not to move forward with the 1996 Draft EIS in its immediate form. Instead, DOE decided to revise its strategy to address the remaining activities required under the WVDP Act in two phases (and two EISs) – the first covering short-term, offsite waste disposal activities and the second covering longer-term closure and stewardship activities.

1.4.1 Waste Management EIS

The Final Waste Management EIS (DOE 2003b) on short-term, offsite waste disposal activities was issued by DOE on January 12, 2004. It addresses, as DOE's preferred alternative:

- Continued onsite management of HLW until it can be shipped to a federal geologic repository,
- Shipping low-level radioactive waste (LLW) and mixed (radioactive and hazardous) LLW offsite for disposal,
- Shipping transuranic waste to the Waste Isolation Pilot Plant near Carlsbad, New Mexico, and
- Actively managing the underground waste tanks, including ventilating them to minimize moisture and associated corrosion.

The EIS Record of Decision was issued in the Federal Register on June 16, 2005 (70 FR 115). It partially implemented the preferred alternative, deferring the decision on transuranic waste shipment pending a determination that this waste meets all statutory and regulatory requirements for disposal at the Waste Isolation Pilot Plant.

1.4.2 Decommissioning EIS

The Decommissioning EIS addresses DOE's remaining activities under the WVDP Act, any waste management activities that could arise as a result of proposed decommissioning activities, and activities related to decommissioning or long-term stewardship of the balance of the Center. DOE and NYSERDA are jointly preparing this EIS.

The Decommissioning EIS also evaluates potential management and disposition actions for those facilities and areas, including the SDA, for which NYSERDA is responsible. The NRC is participating in the Decommissioning EIS as a cooperating agency, as are the U.S. Environmental Protection Agency (EPA) and NYSDEC. A Notice of Intent to prepare the Decommissioning EIS appeared in the Federal Register on March 13, 2003 (68 FR 49).

As noted previously, the proposed decommissioning approach described in this plan is DOE's preferred alternative in the Decommissioning EIS. If changes to that document occur during the National Environmental Policy Act process that affect this plan, such as changes to the preferred alternative, this plan will be revised as necessary to reflect the changes. The proposed activities under the Decommissioning Plan would begin only after issuance of the Decommissioning EIS Record of Decision.

1.5 Decommissioning Criteria

Under the authority of the WVDP Act, the NRC in 2002 issued its Final Policy Statement on the decommissioning criteria for the WVDP (67 FR 22) specifying the application of its License Termination Rule (10 CFR 20, Subpart E) to the decommissioning. This policy statement indicated that the final end-state may involve a long-term or even perpetual license for parts of the site where cleanup to License Termination Rule requirements would be prohibitively expensive or technically impractical. The policy statement also indicated that closure of the underground waste tanks (if the tanks were to be closed in place) must meet specified criteria for incidental waste as set forth in NRC's Final Policy Statement.

The criteria of the License Termination Rule are being applied to the decommissioning of: (1) underground waste tanks and other facilities in which HLW, solidified under the project, was stored; (2) facilities used in the solidification of the waste; and (3) any material and hardware used in connection with the WVDP.

Requirements in 10 CFR 20.1402 address license termination without restrictions. Requirements in 10 CFR 20.1403 address license termination under restricted conditions.

The unrestricted release criteria in 10 CFR 20.1402 state that a site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a total effective dose equivalent to an average member of the critical group that does not exceed 25 mrem per year, including that from groundwater sources of drinking water, and the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA). Determination of the levels which are ALARA must take into account consideration of any detriments, such as deaths from transportation accidents, expected to potentially result from decontamination and waste disposal.

The restricted release criteria of 10 CFR 20.1403 involve addressing matters such as the following:

- That residual radioactivity levels are ALARA;
- Provisions for legally enforceable institutional controls that provide reasonable assurance that the total effective dose equivalent to the average member of the critical group will not exceed 25 mrem per year;
- Financial assurance;
- Considering the advice of individuals and institutions in the community who may be affected by the decommissioning or planned institutional controls; and
- That residual radioactivity at the site has been reduced so that if the institutional controls were no longer in effect, there is reasonable assurance that the total effective dose equivalent from residual radioactivity to the average member of the critical group is ALARA and would not exceed either (1) 100 mrem per year or (2) 500 mrem per year provided certain conditions are met.

In 2003, NRC issued an Implementation Plan for its Final Policy Statement on the Decommissioning Criteria for the WVDP (NRC 2003b).

Although Phase 1 of the WVDP proposed decommissioning would not result in license termination under either restricted or unrestricted conditions, this plan does include derived concentration guideline levels (DCGLs) and associated cleanup goals to be used for remediation of surface and subsurface soil in the excavated areas on the project premises described previously that are based on the unrestricted release criteria of 10 CFR 20.1402.[7] The cleanup goals take into account the results of a limited, site-wide integrated dose assessment. This assessment was performed to ensure that conditions in the excavations for the Process Building-Vitrification Facility and Low-Level Waste Treatment Facility lagoon areas at the conclusion of Phase 1 would not limit potential approaches that may be considered for Phase 2 of the proposed decommissioning.

1.6 Project Management and Organization

The project would be managed in accordance with DOE requirements in a manner similar to deactivation work currently underway at the WVDP. Necessary tasks would be defined and scheduled. Appropriate schedules would be used for this purpose, such as a long-range schedule, short-range schedules, and plans-of-the-week. NRC would be provided copies of these schedules for information.

Implementing plans would be prepared as necessary in support of the work. Examples of these plans include:

- A Health and Safety Plan to implement requirements outlined in Section 1.7;

[7] The DCGLs and cleanup goals for Sr-90 and Cs-137 incorporate a 30-year decay period from 2011. That is, achieving residual radioactivity levels less than the cleanup goals for these radionuclides would ensure that dose criteria of 10 CFR 20.1402 would be met in 2041 and any time thereafter, around the time when the vitrified HLW canisters are expected to be shipped to the federal geologic repository.

- Decommissioning Work Plans for demolition of major facilities, which are discussed in Section 7;
- A Quality Assurance Project Plan, which is described in Section 8;
- A Characterization Sample and Analysis Plan, which is described in Section 9, and
- A Final Status Survey Plan, which is also described in Section 9.

NRC would be provided copies of these plans for information.

Written procedures would be prepared as necessary to support the project activities. Work packages would be used for individual procedures or groups of procedures. After completion of work activities, the work packages would be formally closed out to ensure that all required work was accomplished.

Radiological work permits would be prepared as necessary and approved by the Radiological Control Manager or his or her designee in accordance with applicable DOE procedures. Persons working in areas covered by radiological work permits would be briefed before starting work in accordance with DOE procedures.

Training of project personnel would be commensurate with their experience, their responsibilities and the potential hazards to which they could be exposed. Records would be maintained showing the employee's name, training date, type of training received and other relevant information. This training would include, as applicable:

- General Employee Training, which would consist of a general orientation on site requirements and policies;
- Radiation worker training, with formal written and practical examinations to certify that the individuals are qualified as radiation workers;
- Radiological control technician training, also with formal written and practical examinations to certify individual qualification;
- Job-specific training, which would be performed as appropriate for individual jobs; and
- Pre-shift briefings, which would be conducted as appropriate at the beginning of each work shift.

DOE would employ a contractor to accomplish the proposed Phase 1 decommissioning activities. The decommissioning contractor organization would provide the necessary functions to this end, such as operations, engineering, radiological controls, health and safety, quality assurance, and training.

The decommissioning contractor senior executive would be responsible to the Director of the WVDP for carrying out the proposed decommissioning work in accordance with applicable DOE requirements and guidance as specified in the contract. The requirements would include this plan and all of its provisions, such as those associated with the health and safety program, environmental monitoring and control, and radioactive waste management as specified in the subsections that follow. Additional contractual provisions may also be invoked by DOE, such as compliance with DOE-STD-1107-97, *Knowledge, Skills, and*

Abilities for Key Radiation Protection Positions at DOE Facilities, and (2) DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for Nuclear Facilities*.

1.7 Health and Safety Program

The health and safety program for Phase 1 of the proposed decommissioning would be based on DOE procedures. This approach is consistent with DOE's authority and responsibilities to protect human health and safety under applicable laws and the provisions of the WVDP Act.

The DOE procedures that address radiological safety controls during decommissioning appear in the form of regulations, directives (orders, policies, guides, and manuals), and supplemental technical standards, and in contract conditions with its site or decommissioning contractors. DOE and its decommissioning contractor would follow these procedures for radiation safety controls and monitoring for workers during Phase 1 of the proposed decommissioning, along with other applicable requirements and guidance.

Among the applicable DOE procedures is a policy statement that expresses the Department's position to ensure that radiation exposures to its workers and the public and releases of radioactivity to the environment are maintained below regulatory limits, and that deliberate efforts are taken to further reduce exposures and releases to ALARA. This statement appears in DOE Policy 441.1.

Applicable requirements include the following:

- 10 CFR 830, *Nuclear Safety Management*
- 10 CFR 835, *Occupational Radiation Protection*
- 29 CFR 1910.134, *Respiratory Protection*
- DOE Order 420.1B, *Facility Safety*
- DOE Order 430.1B, *Real Property Asset Management*
- DOE Order 5400.5, *Radiation Protection of the Public and the Environment*
- DOE Manual 231.1-1A, *Environment, Safety, and Health Reporting Manual*

The Department's supplemental technical standards associated with these requirements would also be followed.

1.8 Environmental Monitoring and Control

DOE has maintained an extensive environmental monitoring and control program at the site since 1982 to satisfy the environmental monitoring requirements of federal and state laws and regulations and of DOE Orders and technical standards, and to comply with environmental permits that have been issued to the WVDP by NYSDEC and the EPA. Annual environmental monitoring reports (WVES and URS 2008) describe the results of this program.

The environmental monitoring and control program that would be implemented during Phase 1 of the proposed decommissioning would be based on the program currently in place

at the WVDP. It would continue to comply with federal and state laws, federal and state environmental permits, DOE Orders and technical standards, and other applicable requirements and guidance under which the WVDP operates, which are consistent with the applicable NRC requirements of 10 CFR 20.

Three major elements of this program are: (1) the ALARA evaluation program, (2) the effluent monitoring program, and (3) the effluent control program. The program would be modified as necessary during decommissioning to ensure compliance with applicable requirements. As noted in Section 1.7, it is DOE policy to ensure that releases of radioactivity to the environment are maintained below regulatory limits, and that deliberate efforts are taken to further reduce releases to ALARA (DOE Policy 441.1).

The proposed decommissioning environmental program would meet the following monitoring and control requirements:

- Clean Air Act of 1970, as amended
- Clean Water Act of 1977
- Resource Conservation and Recovery Act of 1976, as amended
- Executive Order 11988, *Floodplain Management* (42 FR 26951)
- Executive Order 11990, *Protection of Wetlands* (42 FR 26961)
- Executive Order 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements* (58 FR 150)
- Executive Order 13101, *Greening the Government through Waste Prevention, Recycling, and Federal Acquisition* (63 FR 179)
- Executive Order 13148, *Greening the Government through Leadership in Environmental Management* (65 FR 81)
- 10 CFR 830.122, *Quality Assurance Criteria*
- 40 CFR 61, *National Emission Standards for Hazardous Air Pollutants*
- 40 CFR 141, *National Primary Drinking Water Regulations*
- 40 CFR 143, *National Secondary Drinking Water Regulations*
- DOE Manual 231.1-1A, *Environment, Safety, and Health Reporting Manual*
- DOE Order 414.1C, *Quality Assurance*
- DOE Order 435.1, *Radioactive Waste Management*
- DOE Order 440.1B, *Worker Protection Management for DOE Federal Employees*
- DOE Order 450.1, *Environmental Protection Program*
- DOE Order 451.1B, *National Environmental Policy Act Compliance Program*
- DOE Order 5400.5, *Radiation Protection of the Public and the Environment*

DOE and the decommissioning contractor would also comply with applicable DOE technical standards, active site environmental permits, and active administrative orders of consent associated with the Resource Conservation and Recovery Act.

Note that information specified in NUREG-1748, *Environmental Review Guidance for Licensing Actions Associated with NMSS Programs* (NRC 2003c), that is normally provided in decommissioning plans, can be found in Section 3 of this plan, in the Decommissioning EIS, or both.

1.9 Radioactive Waste Management

The radioactive waste management program for Phase 1 of the proposed decommissioning would also be based on DOE procedures, consistent with the provisions of the WVDP Act. The WVDP Act states that DOE shall, in accordance with applicable license requirements, dispose of LLW and transuranic waste produced by the solidification of the HLW under the project.[8]

The DOE procedures that address waste management appear in the form of requirements contained in the Code of Federal Regulations, in DOE Orders, and in guidance contained in supplemental technical standards. DOE and its decommissioning contractor would follow these procedures for management of radioactive waste during Phase 1 of the proposed decommissioning, along with other applicable requirements and guidance.

The principal requirements for management of DOE radioactive waste appear in DOE Order 435.1, *Radioactive Waste Management*. This order applies to HLW, transuranic waste, and LLW, and to the radioactive component of mixed waste. Additional detailed requirements appear in DOE Manual 435.1-1, *Radioactive Waste Management Manual*. Detailed guidance for implementation of these requirements is given in DOE Guide 435.1, *Implementation Guide for Use with DOE M 435.1*.

Other applicable requirements include the following:

- 10 CFR 830.120, *Quality Assurance Requirements*
- 10 CFR 835, *Occupational Radiation Protection*
- DOE Order 414.1C, *Quality Assurance*
- DOE Order 460.1B, *Packaging and Transportation Safety*

The proposed Phase 1 decommissioning waste management activities would also be consistent with applicable federal laws such as the Resource Conservation and Recovery Act of 1976, as amended, and the Toxic Substances Control Act of 1976, as amended, and with applicable permits and consent orders. These activities would also be consistent with other applicable DOE guidance, such as that contained in DOE Guide 460.1-1, *Implementation Guide for Use with DOE Order 460.1A.*

[8] The WVDP Act also states that DOE "shall, as soon as feasible, transport in accordance with applicable provisions of law, the waste solidified at the Center [the vitrified HLW canisters] to an appropriate Federal repository for permanent disposal." This activity would take place in Phase 2 of the decommissioning.

All radioactive waste produced during the decommissioning would be disposed of offsite at appropriate government-owned or commercial facilities. In some cases, waste produced would be temporarily stored onsite for later shipment. Note that at the time this plan was completed, there was no approved disposal path for transuranic waste that would be generated during Phase 1 of the proposed decommissioning. Transuranic waste generated would therefore be temporarily stored onsite until such time that it can be shipped to an approved disposal facility.

1.10 Planned End States Before and After Phase 1

Site deactivation activities will produce conditions known as the interim end state that will be the conditions in effect at the start of the proposed Phase 1 decommissioning work.

1.10.1 The Interim End State

The map of the project premises shown in Figure 1-2 depicts the facilities that will still be in place at the start of proposed Phase 1 decommissioning activities. It shows the waste management areas (WMAs) into which the project premises has been divided for remediation purposes. It also shows the two large excavations for removal of facilities in WMA 1 and WMA 2 during the proposed Phase 1 decommissioning work, as explained in Section 1.10.2 below.

The deactivation activities required to achieve the interim end state will include removal of other ancillary facilities not shown in Figure 1-2. Certain facilities will be partially decontaminated to facilitate demolition during Phase 1 without the use of radiological containment. Section 3 of this plan describes the facilities in detail.

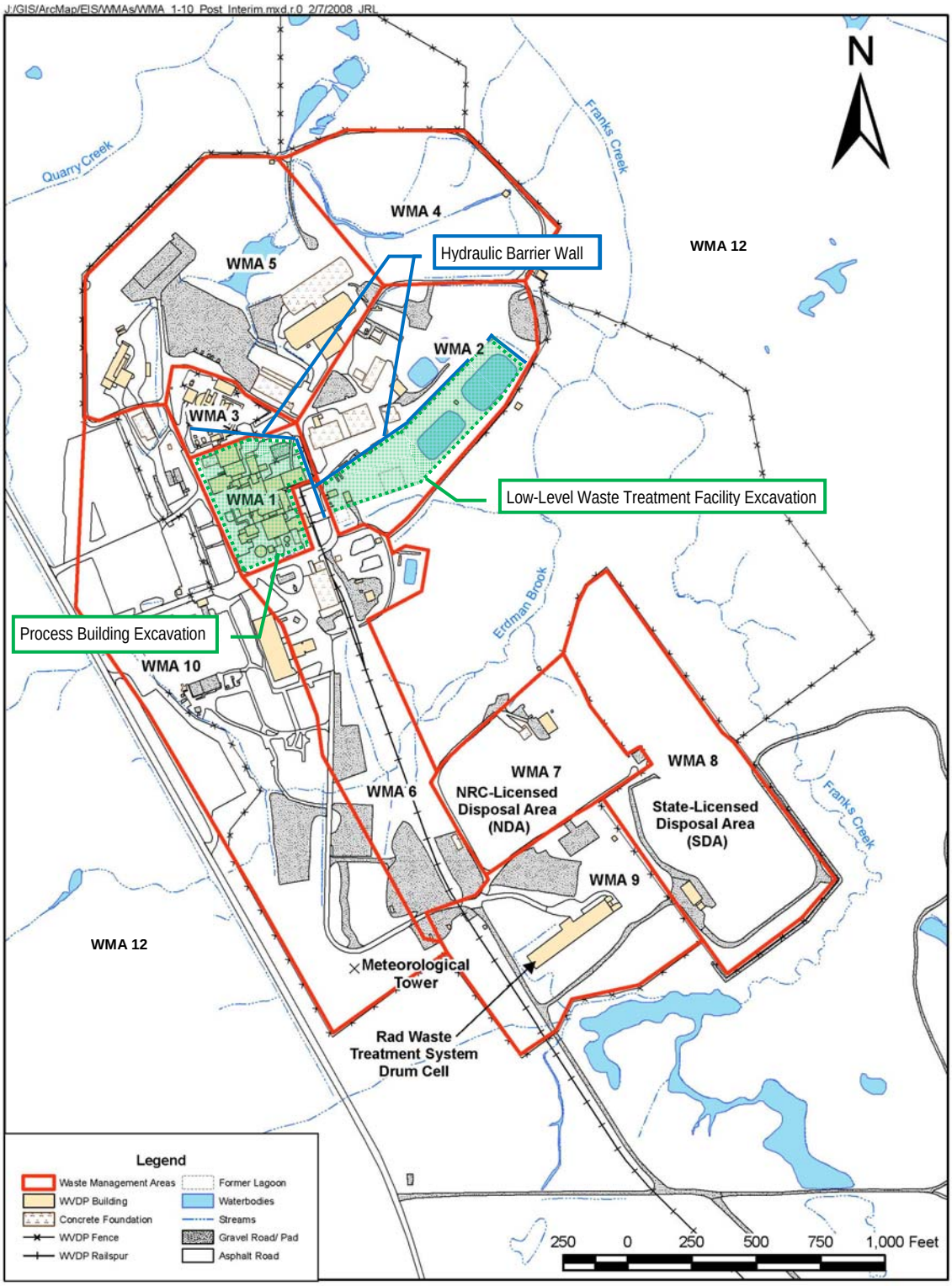

Figure 1-2. The Project Premises Showing WMAs and the Phase 1 Excavations

WMA 1

The partially decontaminated facilities in WMA 1 are the Process Building, the Vitrification Facility, and the 01-14 Building. The other facilities that will remain within WMA 1 when the interim end state is reached are the Utility Room, the Utility Room Expansion, the Plant Office Building, the Load-in/Load-out Facility, the Electrical Substation, the Fire Pumphouse, and the Water Storage Tank. Figure 1-3 shows these facilities, along with the Laundry Room, which will be removed in achieving the interim end state.[9]

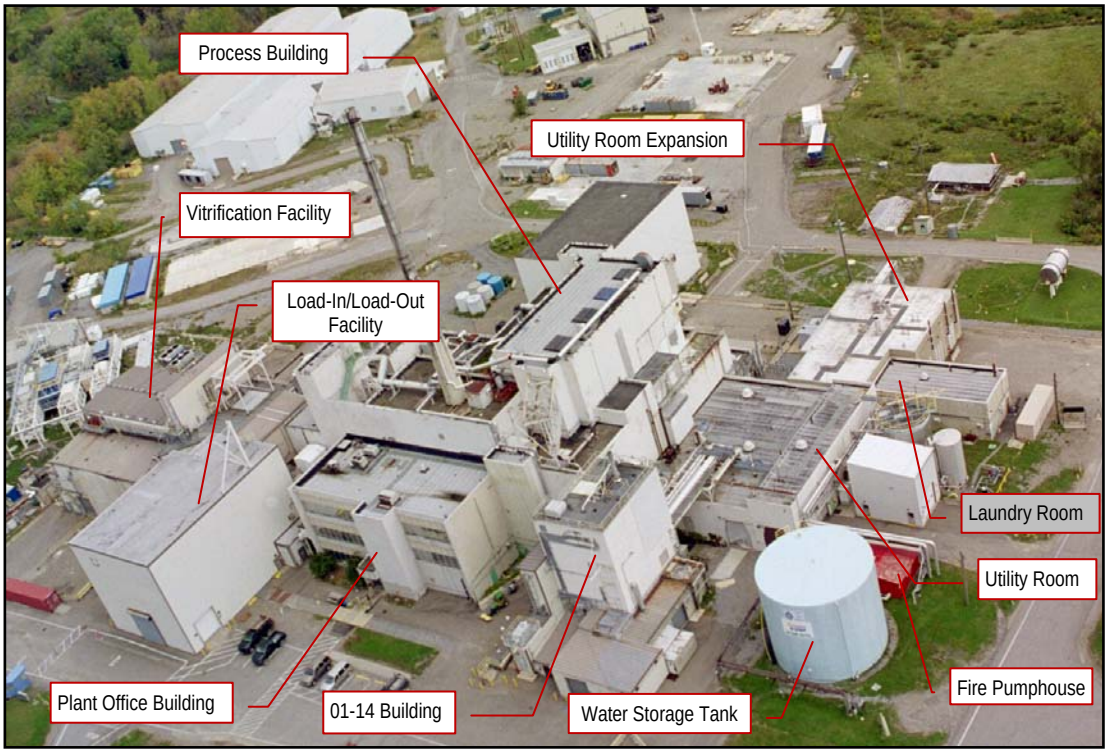

Figure 1-3. WMA 1 Area in 2007

WMA 2

The facilities that will remain in WMA 2, the Low-Level Waste Treatment Facility area, when the interim end state is reached include the five lagoons, with Lagoon 1 having been backfilled in 1984; the LLW2 Facility; the two New Interceptors; the Old Interceptor; the Neutralization Pit; the inactive Solvent Dike, the pilot permeable treatment wall; and the Maintenance Shop Leach Field. Concrete floor slabs and foundations for removed facilities such as the Maintenance Shop will also remain in place. Figure 1-4 shows this area.

One additional facility will be installed in WMA 2 as part of the work to achieve the interim end state: a full-scale permeable treatment wall to control the leading edge of the north plateau groundwater plume.

[9] The Electrical Substation, which is located behind the Process Building, cannot be seen in the photograph.

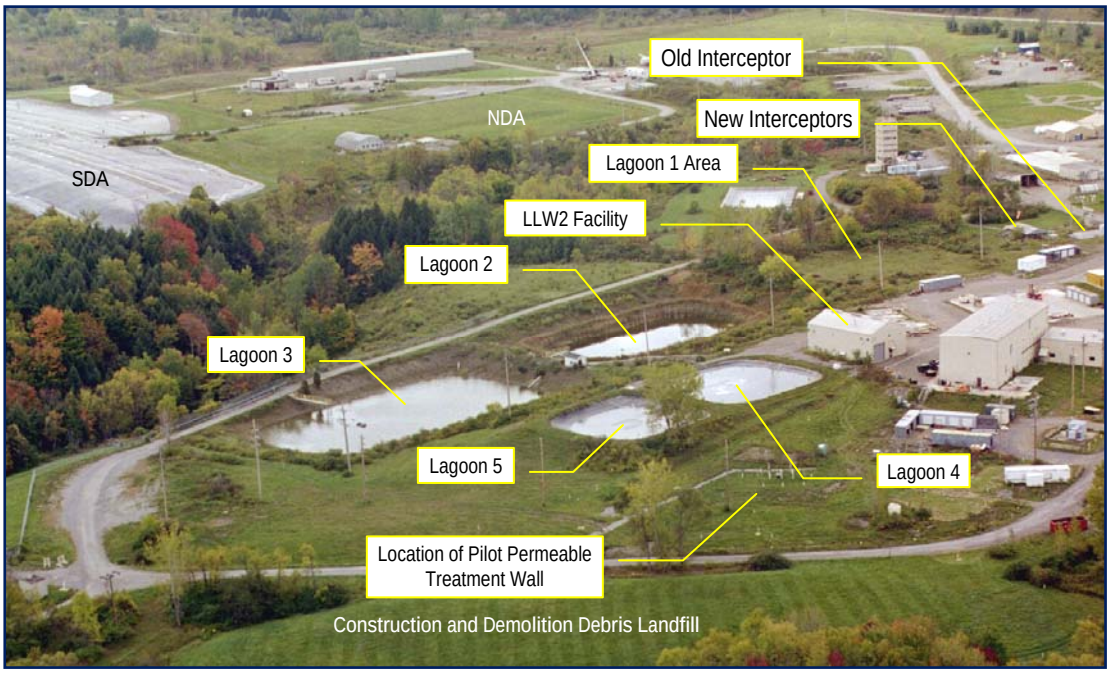

Figure 1-4. WMA 2 in 2007

WMA 3

In WMA 3, the four underground waste tanks will remain in place, along with the Permanent Ventilation System Building, the Supernatant Treatment System Support Building, the Equipment Shelter and condensers, the Con-Ed Building, and the HLW transfer trench. The tank drying system used to dry up liquid in the waste tanks will be still operational. The tank mobilization and transfer pumps and their support structures will remain in place.

Other WMAs

The closed Construction and Demolition Debris Landfill will remain in WMA 4. A permeable reactive barrier will be installed in a surface drainage ditch in WMA 4 as part of work to achieve the interim end state as a north plateau groundwater plume control measure.

Two buildings will remain in WMA 5, Lag Storage 4 and its associated shipping depot and the Remote-Handled Waste Facility. Two structures will remain in WMA 6 along with the Equalization Basin, the Equalization Tank, and the two demineralizer sludge ponds. The Old Sewage Treatment Plant will have been completely removed.

The NDA will remain in place in WMA 7, with the Interim Waste Storage Area removed and a new geomembrane cover and upgradient hydraulic barrier wall installed to control infiltration. The Radwaste Treatment System Drum Cell will remain in place in WMA 9. The New Warehouse, the Meteorological Tower, and the Security Gatehouse will remain in place in WMA 10, along with the security fence that surrounds the project premises.

1.10.2 Facilities and Areas Within Phase 1 Scope

Table 1-1 lists the facilities that are within the scope of Phase 1 of the proposed decommissioning. These facilities are described in Section 3 of this plan. Figures 1-5 and 1-6 show their locations on the project premises. Remediation of surface soil and sediment on the project premises would be accomplished as indicated in the table.

The new Canister Interim Waste Storage Facility for the vitrified HLW canisters would be constructed on the south plateau near the rail spur early in Phase 1 and the canisters moved to this location. The HLW canisters would be stored at this facility inside shielded canisters[10].

The soil and sediment characterization program would be undertaken early in Phase 1 to better define the nature and extent of radioactive contamination in surface soil and stream sediment on the project premises. However, removal of contaminated soil and sediment in excess of the cleanup goals would be limited to the areas of the major excavations in WMA 1 and WMA 2 unless this plan is revised to provide for additional soil removal after evaluation of the characterization data.

Before the large excavations for removal of the Process Building and the Low-Level Waste Treatment Facility shown in Figure 1-2 are filled in, Phase 1 final status surveys[11] of the excavated areas would be performed and arrangements made for regulator confirmatory surveys. The same process would be used for excavations associated with removal of concrete floor slabs, foundations, and gravel pads, which would be up to two feet deep.

Mitigative measures would be taken as described in Section 7 to eliminate or reduce potential impacts to human health and the environment during the proposed decommissioning work and to prevent recontamination of remediated areas.

[10]Section 7 of this plan describes the general conceptual design of the new Interim Waste Storage Facility, which may be changed somewhat as the design is finalized.

[11] These surveys would be performed following guidance in the *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* (NRC 2000) and the provisions of NUREG-1575, Volume 2 (NRC 2006).

Table 1-1. Facilities and Areas Within Phase 1 Decommissioning Scope(1)

WMA	Facility or Area to be Removed or Remediated	Remarks
1	Process Building	The HLW canisters would be moved to a new Interim Waste Storage Facility located on the south plateau. All listed facilities would be removed along with the source area of the north plateau groundwater plume. A single large excavation would be dug for this purpose. A vertical hydraulic barrier wall would be installed on the north and east sides of the excavation as shown in Figure 1-2. The soil in the excavated area would be removed to cleanup goals for unrestricted release. The vertical hydraulic barrier wall installed on the north and west side of the excavation would remain in place. The south hydraulic barrier wall would be removed after the excavation is backfilled.
	Utility Room	
	Utility Room Expansion	
	Plant Office Building	
	Vitrification Facility	
	01-14 Building	
	Load-in/Load-out Facility	
	Fire Pumphouse	
	Water Storage Tank	
	Electrical Substation	
	Off-Gas Trench	
	Underground piping and wastewater tanks (3)	
	Other remaining concrete slabs	
	Source area of North Plateau Groundwater Plume	
2	Low-Level Waste Treatment Facility Building	A single excavation would be made to remove Lagoons 1, 2, and 3, the Interceptors, the Neutralization Pit, and the Solvent Dike. Underlying soil and sediment in this excavation would be removed to cleanup goals that support unrestricted release. The vertical hydraulic barrier wall shown in Figure 1-2 would remain in place.
	Lagoons 1 – 5	
	New Interceptors (2)	
	Old Interceptor	
	Neutralization Pit	
	Solvent Dike	
	Maintenance Shop Leach Field	
	Remaining concrete floor slabs and foundations	
3	Mobilization and Transfer Pumps	The support structures for the mobilization and transfer pumps would be removed as well as the pumps themselves.
	Piping and equipment in HLW Transfer Trench	
	Con-Ed Building	
	Equipment Shelter and Condensers	
5	Lag Storage Area 4 and Shipping Depot	
	Remote-Handled Waste Facility	
	Remaining concrete floor slabs, hardstands, and gravel pads	
6	Sewage Treatment Plant	The rail spur would remain operational.
	South Waste Tank Farm Test Tower	
	Remaining concrete floor slabs and foundations	
	Asphalt, concrete, and gravel pads(2)	
	Equalization Basin	
	Equalization Tank	
	Demineralizer Sludge Ponds (2)	
	Cooling Tower basin	
7	NDA hardstand	
9	Radwaste Treatment System Drum Cell	
	Trench soil container area, other pads	
10	New Warehouse	
	Former Waste Management Storage Area	
	Remaining concrete floor slabs and foundations	
	Surface soil and sediment within the project premises	To be remediated only in the Process Building-Vitrification Facility and Low-Level Waste Treatment Facility excavation areas. Soil and sediment is other areas may be remediated in Phase 1 by revision to this plan.

NOTES: (1) See Section 3 of this plan for facility descriptions. (2) Including the LLW Rail Packaging and Staging Area.

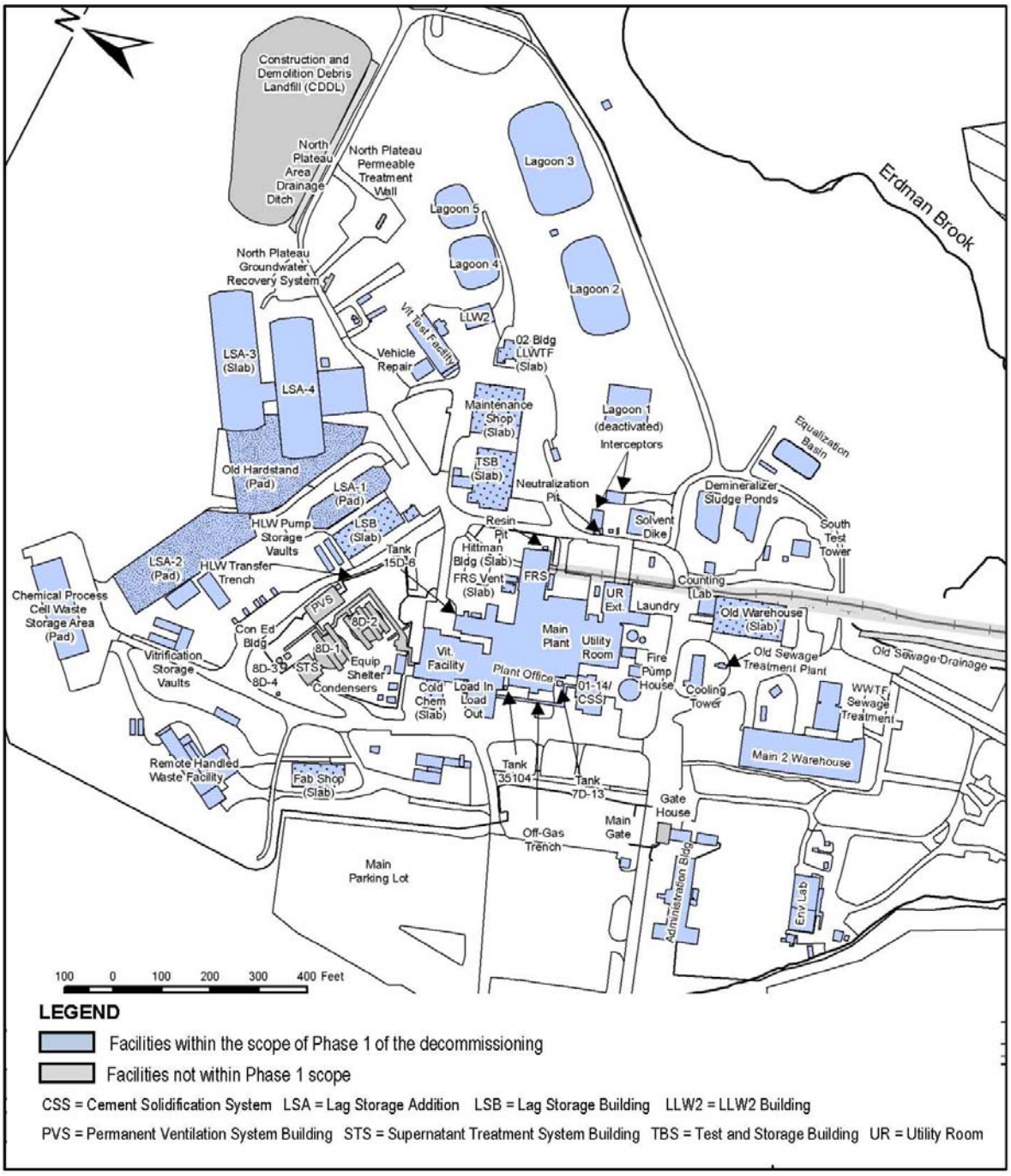

Figure 1-5. Facilities Within the Scope of Phase 1 of the Decommissioning, North Plateau

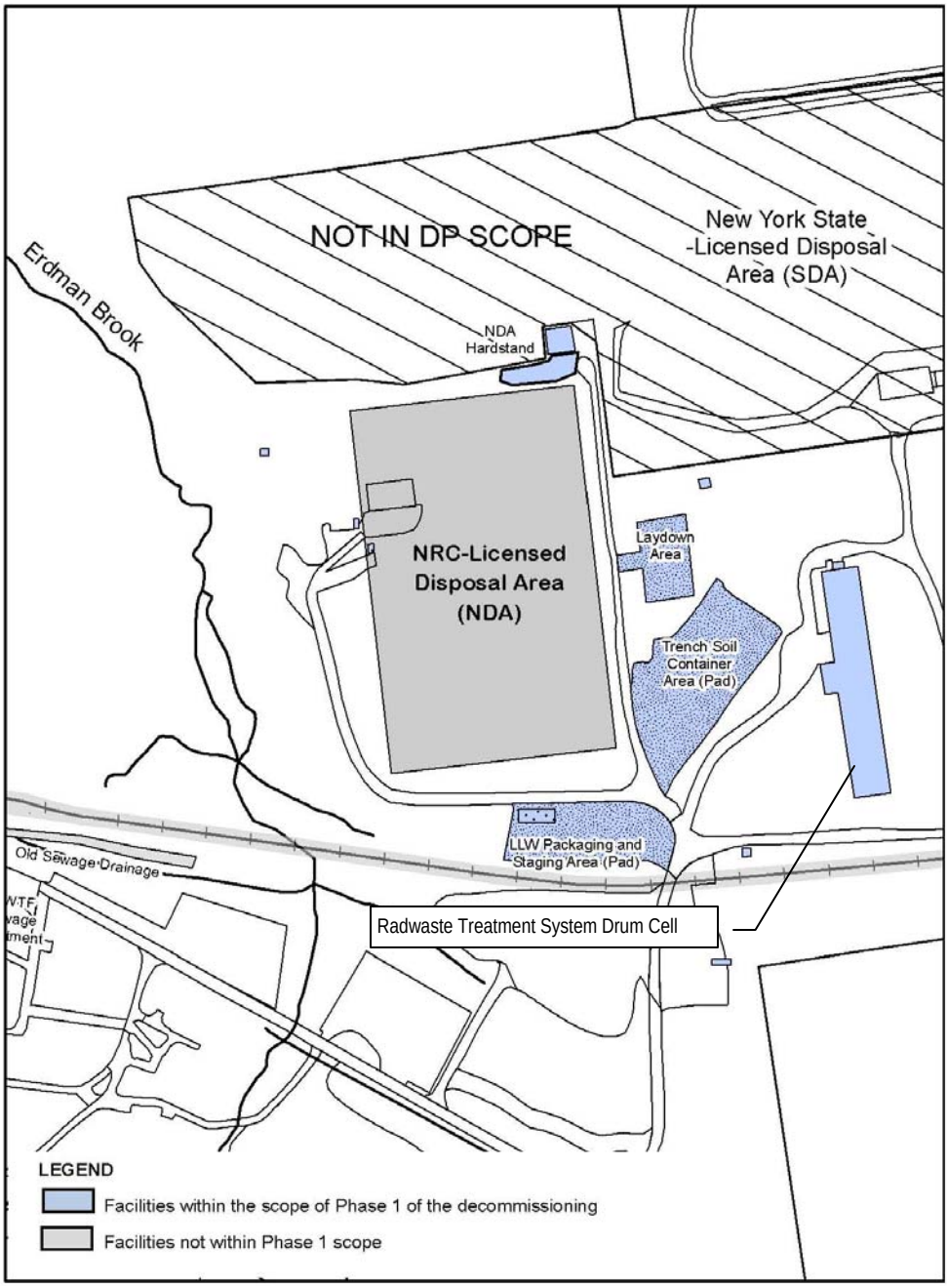

Figure 1-6. Facilities Within the Scope of Phase 1 of the Decommissioning, South Plateau

Figure 1-7 shows the expected appearance of the project premises in the interim end state, when proposed Phase 1 decommissioning activities would begin.

Figure 1-7. The WVDP in the Interim End State

Figure 1-8 shows the planned general appearance of the project premises after completion of the proposed Phase 1 decommissioning activities. The interim storage area for the HLW canisters would be located on the south plateau near the rail spur.

Figure 1-8. The WVDP After Completion of Phase 1

1.11 Organizational Responsibilities

Because the proposed WVDP decommissioning is being carried out under the authority of the WVDP Act, organizational responsibilities are different from decommissioning of a

typical NRC-licensed site. The organizational responsibilities prescribed by the WVDP Act for decontamination and decommissioning of the WVDP are summarized below.

1.11.1 DOE

The Act directed the DOE to carry out the following activities: (1) Solidify the HLW, (2) develop containers suitable for permanent disposal of the solidified HLW waste, (3) transport the waste to a federal repository for permanent disposal, (4) dispose of LLW and transuranic waste produced in the solidification of the HLW, and (5) decontaminate and decommission the tanks, facilities, materials, and hardware used in the project in accordance with requirements prescribed by the NRC.

The Act also directed DOE to enter into a cooperative agreement with the State for the State to make available to DOE the facilities and HLW necessary to carry out the project, without transfer of title, with DOE providing technical assistance in securing required license amendments. The Act directed DOE to enter into an agreement with the NRC for review and consultation on the project by NRC and to afford NRC access to the site to monitor activities under the project for the purposes of health and safety. Both of these agreements were formalized in 1981 (DOE and NYSERDA 1981, DOE and NRC 1981).

The Act further directed DOE to consult with the EPA in carrying out the project. Under the WVDP Act, DOE is responsible for the activities outlined above and for determining the manner in which facilities, materials, and hardware for which DOE is responsible are managed or decommissioned, in accordance with applicable federal and state requirements. To this end, DOE would determine what, if any, material or structures for which DOE is responsible would remain on site and what, if any, institutional controls, engineered barriers, or stewardship provisions would be needed.

The Act also set up a cost sharing arrangement for the WVDP, with DOE paying 90 percent of the total project costs and the State paying 10 percent of these costs.

DOE is responsible as noted previously for certain matters associated with the decommissioning: (1) project management and the decommissioning organization, (2) safety and health, (3) waste management, and (4) environmental protection.

1.11.2 NRC

The WVDP Act gave NRC the authority to prescribe requirements for decontamination and decommissioning and to review and consult with DOE, not to include formal procedures or actions pursuant to the Atomic Energy Act or any other law. It also gave NRC monitoring responsibilities for the purpose of assuring public health and safety. Pursuant to these responsibilities, NRC will issue public reports during decommissioning to document its position with respect to DOE compliance with NRC decommissioning criteria. The WVDP Act does not give NRC licensing authority over DOE.

NRC is also a cooperating agency in development of the Decommissioning EIS, as mentioned previously.

1.11.3 NYSERDA

As explained in the NRC Implementation Plan (NRC 2003b), NYSERDA would determine the manner in which facilities and property for which NYSERDA is responsible are managed and decommissioned, in accordance with applicable federal and state requirements. To this end, NYSERDA would determine what, if any, material or structures for which it is responsible would remain on the site and what, if any, institutional controls, engineered barriers, or stewardship provisions would be needed.

The NRC Implementation Plan also indicates that if NYSERDA decides to terminate the license after DOE completes proposed decommissioning activities for the project facilities, NYSERDA would be required to submit a decommissioning plan. As noted previously, NYSERDA is jointly preparing the Decommissioning EIS with DOE.

1.12 Organization of this Plan

The organization and content of this plan are generally consistent with Volume 1 of NUREG-1757 (NRC 2006). Differences are described in Appendix A, which consists of an annotated version of the decommissioning plan evaluation checklist found in Appendix D to NUREG-1757, Volume 1 (DOE 2006). NRC has concurred with certain topics not being applicable to this decommissioning as shown in the Appendix A checklist (NRC 2008).

The contents of the plan are described in the Table of Contents. To aid readability, certain details appear in appendices.

1.13 Control of Changes

DOE plans to treat this plan as a "living document," revising it when circumstances warrant. DOE may issue revisions to make significant changes that could affect the project end conditions. Such revisions would be provided to NRC for review and comment prior to issue. After NRC comments are incorporated or otherwise formally resolved, DOE would issue the revised plan.

DOE may make changes to the plan that could not affect the project end conditions without providing them to NRC for review and comment. DOE would informally consult with NRC on such changes prior to issue to ensure that NRC concurs that the changes could not affect project end conditions. NRC would be provided copies of such changes when they are issued. Examples of such changes could include:

- A change to reflect actual conditions of a particular facility at the end of deactivation work planned for the 2008 – 2011 period,
- A change in decontamination methods, or
- A change to include information on additional ALARA analyses performed after proposed decommissioning activities began that did not result in a change to the decommissioning approach.

1.14 References

Federal Statutes

Clean Air Act of 1970, as amended.

Clean Water Act (Federal Water Pollution Control Act) of 1977.

Toxic Substances Control Act of 1976, as amended.

Resource Conservation and Recovery Act of 1976, as amended.

West Valley Demonstration Project Act, Public Law 96-368 (S. 2443), of October 1, 1980 (and related legislative history).

Code of Federal Regulations and Federal Register Notices

10 CFR 20, *Standards for Protection Against Radiation*

10 CFR 20, Subpart E., *Radiological Criteria For License Termination (LTR)*.

10 CFR 830, *Nuclear Safety Management.*

10 CFR 835, *Occupational Radiation Protection*

29 CFR 1910.134, *Respiratory Protection.*

40 CFR 61, *National Emission Standards for Hazardous Air Pollutants.*

40 CFR 141, *National Primary Drinking Water Regulations*.

40 CFR 143, *National Secondary Drinking Water Regulations*.

42 FR 26951, Executive Order 11988, *Floodplain Management*. Federal Register, May 24, 1977.

42 FR 26961, Executive Order 11990, *Protection of Wetlands*. Federal Register, May 24, 1977.

58 FR 150, Executive Order 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements*. Federal Register, August 6, 1993.

63 FR 179, Executive Order 13101, *Greening the Government through Waste Prevention, Recycling, and Federal Acquisition*. Federal Register, September 16, 1998.

65 FR 81, Executive Order 13148, *Greening the Government through Leadership in Environmental Management*. Federal Register, April 26, 2000.

67 FR 22, *Decommissioning Criteria for the West Valley Demonstration Project (M-32) at the West Valley Site; Final Policy Statement*. Federal Register, February 1, 2002.

68 FR 49, *Notice of Intent to Prepare an Environmental Impact Statement for Decommissioning and/or Long-Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center*. Federal Register, March 13, 2003.

70 FR 115*, West Valley Demonstration Project Waste Management Environmental Impact Statement, Record of Decision.* Federal Register, June 16, 2005.

DOE Orders, Policies, Manuals, Standards, and Guides

DOE Order 414.1C, Change 1, *Quality Assurance*. U.S. Department of Energy, Washington, D.C., June 17, 2005.

DOE Order 420.1B, *Facility Safety*. U.S. Department of Energy, Washington, D.C., December 22, 2005.

DOE Order 430.1B, *Real Property Asset Management*. U.S. Department of Energy, Washington, D.C., February 8, 2008.

DOE Order 435.1, Change 1, *Radioactive Waste Management*. U.S. Department of Energy, Washington, D.C., August 28, 2001.

DOE Order 440.1B, *Worker Protection Management for DOE Federal and Contractor Employees.* U.S. Department of Energy, Washington, D.C., May 17, 2007.

DOE Order 450.1, *Environmental Protection Program*. U.S. Department of Energy, Washington, D.C., January 15, 2003.

DOE Order 451.1B, Change 1, *National Environmental Policy Act Compliance Program*. U.S. Department of Energy, Washington, D.C., September 28, 2001.

DOE Order 460.1B, *Packaging and Transportation Safety*. U.S. Department of Energy, Washington, DC, April 4, 2003.

DOE Order 5400.5, Change 2, *Radiation Protection of the Public and the Environment*. U.S. Department of Energy, Washington, D.C., January 7, 1993.

DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for Nuclear Facilities*. U.S. Department of Energy, Washington, D.C., November 15, 1994.

DOE Policy 441.1, *Department of Energy Radiological Health and Safety Policy*. U.S. Department of Energy, Washington, D.C., April 26, 1996.

DOE Manual 231.1-1A, Change 1, *Environment, Safety, and Health Reporting Manual*. U.S. Department of Energy, Washington, D.C., June 3, 2004.

DOE Manual 435.1-1, Change 1, *Radioactive Waste Management Manual*. U.S. Department of Energy, Washington, D.C., June 19, 2001.

DOE Guide 435.1-1, *Implementation Guide for Use with DOE M 435.1*. U.S. Department of Energy, Washington, D.C., July 9, 1999.

DOE Guide 460.1-1, *Implementation Guide for Use with DOE Order 460.1A.* U.S. Department of Energy, Washington, D.C., June 5, 1997.

DOE-STD-1107-97, *Knowledge, Skills, and Abilities for Key Radiation Protection Positions at DOE Facilities*, Change 1. U.S. Department of Energy, Washington, D.C., November 2007.

Other References

DOE 2003a, DOE Letter from Alice C. Williams (Director, WVDP) to Larry W. Camper of NRC (Chief Decommissioning Branch), dated February 28, 2003.

DOE 2003b, *West Valley Demonstration Project Waste Management Final Environmental Impact Statement,* DOE/0337F. U.S. Department of Energy – West Valley Area Office, West Valley, New York, December 2003.

DOE and NRC 1981, *West Valley Demonstration Project Memorandum of Understanding Between the U.S. Department of Energy and the U.S. Nuclear Regulatory Commission*. September 23, 1981.

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NRC 2000, *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*, NUREG-1575, Revision 1. NRC, Washington, DC, August, 2000. (Also EPA 4-2-R-97-016, Revision 1, U.S. Environmental Protection Agency and DOE-EH-0624, Revision 1, DOE)

NRC 2003a, NRC Letter from Larry W. Camper (Chief Decommissioning Branch) to Alice C. Williams of DOE (Director, WVDP), dated February 2, 2003.

NRC 2003b, *U.S. Nuclear Regulatory Commission Implementation Plan for the Final Policy Statement on Decommissioning Criteria for the West Valley Demonstration Project at the West Valley Site*. U.S. Nuclear Regulatory Commission, Division of Waste Management, Office of Nuclear Materials Safety and Safeguards, Washington, D.C., May 2003.

NRC 2003c, *Environmental Review Guidance for Licensing Actions Associated with NMSS Programs, Final Report*, NUREG-1748. U.S. Nuclear Regulatory Commission, Washington, D.C., August 2003.

NRC 2006, NUREG-1757, *Consolidated Decommissioning Guidance*, *Decommissioning Process for Materials Licensees*, Volume 1, Revision 2. U.S. Nuclear Regulatory Commission, Washington, D.C., September 2006.

NRC 2008, *Report of May 19, 2008 Meeting With U.S. Department of Energy to Discuss the West Valley Demonstration Project Phase 1 Decommissioning Plan*. U.S. Nuclear Regulatory Commission, Washington, D.C., June 2, 2008.

WVES and URS 2008, *West Valley Demonstration Project Annual Site Environmental Report, Calendar Year 2007*. West Valley Environmental Services and URS Group, Inc., West Valley, New York, December 2008.